TYPICAL CROSS SECTIONS MAY BE THE MOST IMPORTANT STEP IN DEVELOPING CONSTRUCTION PLANS, AND AS SUCH, SHOULD BE DEVELOPED AS COMPLETE AS POSSIBLE.

THESE GUIDES ARE NOT INTENDED TO BE FINAL DESIGN TYPICALS, RATHER, THEY ARE INTENDED TO ILLUSTRATE AND PROMOTE UNIFORM DRAFTING CONVENTIONS. THEY ALSO ILLUSTRATE VARIOUS METHODS OF PAVEMENT REHABILITATION THAT MDOT MAY APPLY. THERE ARE ALSO FREEWAY MAINLINE AND RAMP TYPICALS IN APPENDIX 6A OF THE ROAD DESIGN MANUAL.

1 EXISTING TYPICAL CROSS SECTIONS SHOULD BE DEVELOPED AS COMPLETE AS POSSIBLE FROM: OLD PLANS, CORES AND FIELD INSPECTIONS. ALL LAYERS OF ALL MATERIALS SHOULD BE SHOWN INCLUDING SAND AND AGGREGATE, IF KNOWN.

2 USE CONTINUOUS STATIONING WITH NO STATION OVERLAP. ENSURE THE ENTIRE PROJECT HAS A DESIGNATED TYPICAL CROSS SECTION WITH STATION LIMITS. FOR GAP AREAS, IDENTIFY GAPS.

3 FOR HORIZONTAL DIMENSIONS, USE DECIMALS, NOT FEET AND INCHES(ONLY FOR FRACTIONAL DIMENSIONS, EX 12' NOT 12.00'; 2.5' NOT 2' 6"; 2.67' NOT 2' 8"). VERTICAL DIMENSIONS ARE TYPICALLY IN INCHES (18", NOT 1'-6" OR 1.5')

4 FILL IN "DESIGN UNIT" WITH THE NAME OF THE MDOT DESIGN UNIT DOING THE DESIGN ON IN HOUSE DESIGN PROJECTS. FOR CONSULTANTS DESIGN PROJECTS, FILL IN THE NAME OF THE PROJECT MANAGER OR MDOT DESIGN UNIT OVERSEEING THE CONSULTANT DESIGN.

5 MOST OLDER CONCRETE PAVEMENTS WERE CONSTRUCTED WITH A PARABOLIC CROWN. (YOU CAN FIND THE ACTUAL PARABOLIC FACTORS IN THE OLD 1960 ROAD DESIGN MANUAL, AND OLD PLANS). THIS SHOULD BE SHOWN ON THE TYPICAL CROSS SECTIONS. IT BECOMES IMPORTANT WHEN MAKING CHANGES TO THE CROWN, ON PROJECTS THAT HAVE AN HMA OVER LAY, AS TO WHETHER THE COLD MILLING IS TO BE DONE TO A UNIFORM THICKNESS, OR PROFILE COLD MILLED AT 2%. IT ALSO MEANS THAT THE HMA THICKNESS IS PROBABLY NOT A UNIFORM THICKNESS AND QUANTITIES WILL VARY.

6 PARABOLIC CROWNS ARE PARTICULARLY IMPORTANT IN SUPERELEVATED SECTIONS. ON A ROADWAY SUPERELEVATED WITH A PARABOLIC CROWN, THE ENTIRE ROADWAY WAS SUPERELEVATED SO THAT ON THE HIGH SIDE THE SUPERELEVATION BECOMES MUCH LESS THAN ON THE LOW SIDE. FOR EXAMPLE, IF A ROADWAY WAS SUPERELEVATED AT 4% (FROM EDGE TO EDGE), THE LOW SIDE MAY BE ABOUT 6%, WHILE THE HIGH SIDE MAY BE ABOUT 2%±.

7 HMA PAVERS PAVE TO A STRAIGHT LINE ON TOP. FOR EXAMPLE, ON A THREE LANE ROAD, THE PAVED SURFACE COULD ACTUALLY BE THREE DISTINCT TANGENT LINES FOR CROSS SLOPE UNLESS THE ROADWAY HAS BEEN WEDGED TO OBTAIN A DESIGNED CROWN. IT IS BEST TO REVIEW THE OLD PLANS FOR THIS CROWN INFORMATION.

8 THE ORIGINAL CROWN POINT ON MANY TWO LANE FREEWAYS WAS LOCATED ON THE CENTER OF THE MEDIAN SIDE LANE, IN ANTICIPATION OF A THIRD LANE. MOST OF THESE OLD PAVEMENTS (BUILT PRIOR TO 1976) WERE PARABOLIC CROWNS. SOME PAVEMENTS BUILT BETWEEN 1971± THROUGH 1986± WERE BUILT ON A STRAIGHT 1.5% CROWN WITH THE CROWN POINT AT THE MEDIAN EDGE OF PAVEMENT.

9 TYPICAL CROSS SECTIONS SHOULD BE DRAWN TO A HORIZONTAL SCALE. HOWEVER, FOR THE ABOVE REASONS, VERTICAL SCALE EXAGGERATION IS OFTEN APPLIED. IN FACT, GREATLY EXAGGERATED DETAILS MAY BE QUITE USEFUL. IN ADDITION TO THE "NORMAL" SCALE TYPICAL CROSS SECTIONS, AN ADDITIONAL TYPICAL CROSS SECTION MAY BE USEFUL WHICH IS EXAGGERATED, AS A MISCELLANEOUS DETAIL, AS MUCH AS 10V:1H. SHOW HORIZONTAL AND VERTICAL SCALE ON THE TYPICAL CROSS SECTIONS.

NOTE: ON THOSE OCCASIONS WHEN THERE ARE SEVERAL CURVES FOR ONE TYPICAL, LIST STA OF BEGINNING CROWN RUNOUT TO STA OF END CROWN RUNOUT UNDER THE SECTION TO APPLY.

10 SUPERELEVATED TYPICAL CROSS SECTIONS SHOULD SHOW STATION RANGES FROM BEGINNING OF CROWN RUNOUT TO END OF CROWN RUNOUT. THE CROWN RUNOUT, SUPER ELEVATION TRANSITION, AND LOCATION OF FULL SUPER ELEVATION SHOULD BE SHOWN ON A TYPE LINE ON THE PROFILE SHEET FOR PLAN WITH PROFILE PLANS. THE CROWN RUNOUT, SUPER ELEVATION TRANSITION AND LOCATION OF FULL SUPER ELEVATION SHOULD BE SHOWN ON A TYPE LINE ON THE PLAN SHEET FOR PLAN ONLY PLANS.

11 DIMENSION LINES SHOULD BE ADDED TO THE TYPICAL CROSS SECTIONS TO SHOW THE LATERAL LIMITS, SUCH AS PAVEMENT REMOVAL AND ROADWAY GRADING. THIS WILL CLARIFY HOW THE SHOULDERS, CURB AND GUTTER, PARKING, ETC. ARE TO BE REMOVED WITH THE ITEM OF PAVEMENT REMOVAL, OR AS C&G REMOVAL OR WITH EXCAVATION/GRADING OPERATIONS. IT MUST BE NOTED IF THERE IS TO BE A DOUBLE PAYMENT FOR REMOVAL OF COMPOSITE PAVEMENTS. DIMENSION LINES & ARROW HEADS ARE "0" WEIGHT.

12 THE EXISTING TYPICAL CROSS SECTION AND PROPOSED TYPICAL CROSS SECTION SHOULD COVER THE STATION RANGE ON THE SAME TYPICAL CROSS SECTION SHEET WHENEVER POSSIBLE. TRANSPOSE THE BOTTOM LINE OF THE PROPOSED TYPICAL CROSS SECTION ONTO THE EXISTING TYPICAL CROSS SECTION, THUS SHOWING THE EXTENT OF THE GRADING OPERATIONS AND SHALL BE LABELED AS "GRADE TO THIS LINE" ON THE EXISTING TYPICAL.

14 PROPOSED WORK ITEMS ON THE TYPICAL CROSS SECTIONS ARE TO BE IN BOLD CAPITAL LETTERS. USE THE PROPER FONTS, SIZES AND LEVELS AS OUTLINED IN THE CADD WORKSTATION GUIDES AND PARAMETERS. "PROPER PAY ITEMS" ON THE PLANS SHEETS ARE TO MATCH THE PAY ITEM CODE BOOK, FOR TRNSPORT PES PURPOSES.

15 JOINT LEGEND AND OTHER CROSS SECTION NOTES ARE PREFERRED IN THE LOWER RIGHT CORNER OF THE FIRST TYPICAL CROSS SECTION SHEET. USE ONLY FOR LONGITUDINAL JOINTS.

16 THE HMA APPLICATION ESTIMATE SHOULD APPEAR ONLY ON THE FIRST TYPICAL SHEET THAT SHOWS AN HMA SECTION. THIS CHART SHOULD BE PLACED IN THE LOWER LEFT CORNER OF THE TYPICAL SHEET.

17 SHOW ALL STATION EQUATIONS.

18 LABEL THE EXISTING AND PROPOSED LANES ON APPROPRIATE TYPICAL. LABEL THE EXISTING AND PROPOSED SHOULDERS ON THE APPROPRIATE TYPICAL.

THE FOLLOWING ITEMS MAY REQUIRE SEPARATE HALF SECTION TYPICALS OR DETAILS AND SHALL BE USED ONLY AS NEEDED.

GUARDRAIL SECTIONS	FILL/CUT SECTIONS	LANE WIDENING
SHOULDER SECTIONS	CURB AND GUTTER SECTIONS	RAMPS
CROSSROADS	TURN LANES	CROSSOVERS

TYPICAL CROSS SECTIONS

			FINAL R.O.W.
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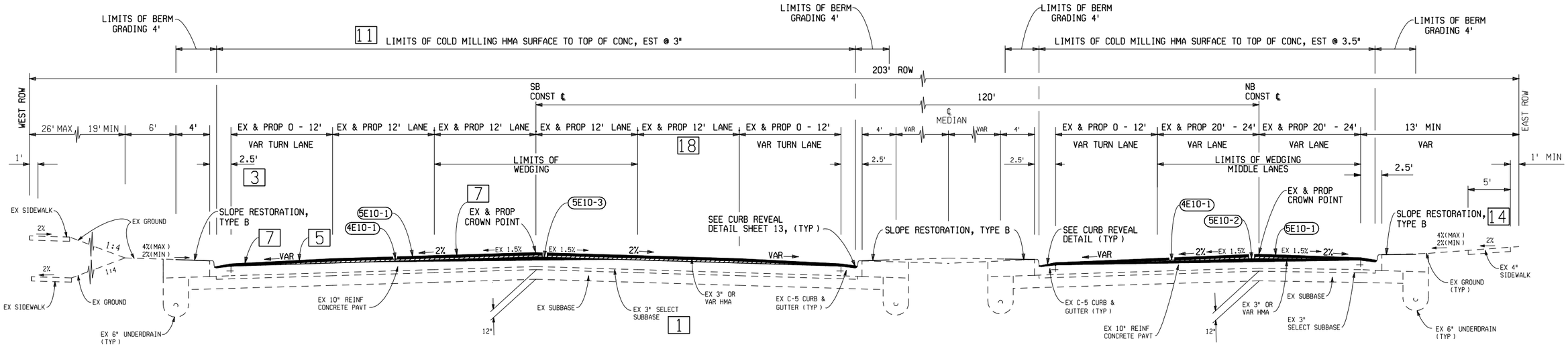
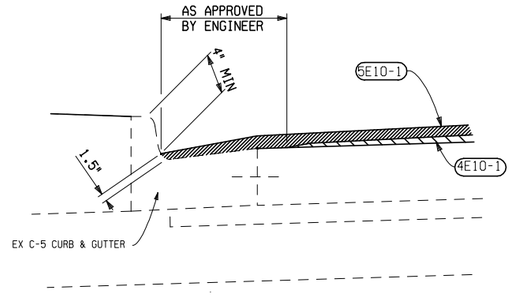


EXISTING & PROPOSED TYPICAL SECTION

TO APPLY TO NB: STA 476+74.41 TO STA 482+32
TO APPLY TO SB: STA 476+24.41 TO STA 482+32 [2]



CURB REVEAL DETAIL

HMA APPLICATION ESTIMATE [16]

IDENT NO.	ITEM	RATE LBS PER SYD	PERFORMANCE GRADE	REMARKS
5E10-1	HMA, 5E10, HIGH STRESS	165	70-22P	TOP COURSE AWI = 260
4E10-1	HMA, 4E10, HIGH STRESS	220	70-22P	LEVELING COURSE
HP	HAND PATCHING	VAR	70-22P	5E10
5E10-2	HMA, 5E10, HIGH STRESS	0-264	70-22P	WEDGING (NORTHBOUND)
5E10-3	HMA, 5E10, HIGH STRESS	0-333	70-22P	WEDGING (SOUTHBOUND)
HMAA-1	HMA, APPROACH, HIGH STRESS	385	70-22P	TOP & LEVELING (2 COURSE 5E10 & 4E10)
	*BOND COAT	0.05-0.15 GAL		

*FOR INFORMATION ONLY

NOTE:
THERE ARE EXISTING FULL DEPTH CONCRETE PATCHES WITHIN THE COLD-MILLING HMA LIMITS. THE FULL DEPTH CONCRETE PATCHES SHALL BE MILLED AND WILL BE PAID FOR AS COLD MILLING HMA SURFACE.

9
0 1 2 3 4 5 6
6 SCALE
(VERTICAL SCALE VARIES)

4-6

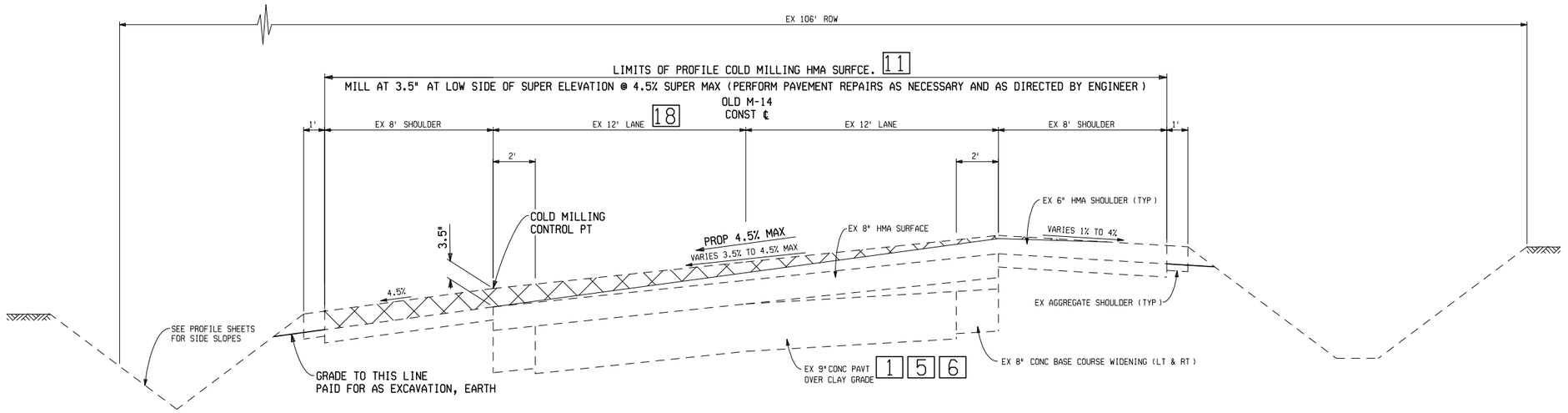
MDOT Michigan Department of Transportation

RESURFACING & WEDGING - URBAN - NORMAL

DATE	CONT. SEC.	JOB NO.	DESIGN UNIT	SHEET NO. R.O.W.	SHEET NO. CONST.
04/05/07			4		

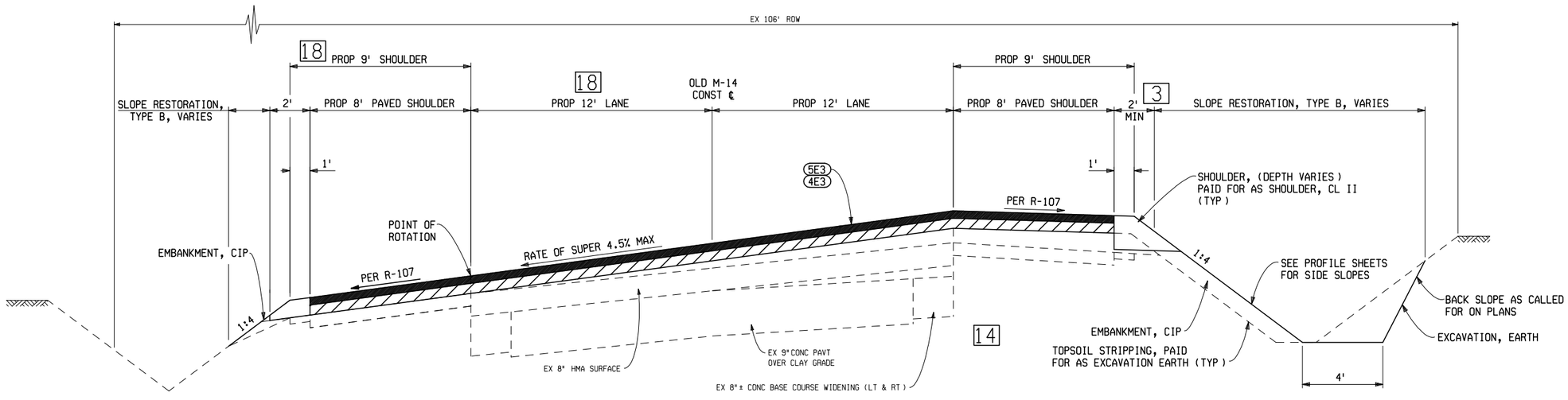
DATE: WORKED ON BY: DATE: CHECKED BY: FILE NAME:

			FINAL R.O.W.
AUTH	DATE	NO.	REVISION



EXISTING TWO LANE SUPERELEVATED SECTION
OLD M-14 (ANN ARBOR ROAD)

TO APPLY : STA 1052+49.94 TO STA 1065+37.59
STA 1137+13.21 TO STA 1148+43.41 2



HMA APPLICATION ESTIMATE 16

IDENT NO.	ITEM	RATE LBS PER SYD	PERFORMANCE GRADE	REMARKS
5E3	HMA, 5E3	165	64-22	TOP COURSE AWI = 260
4E3	HMA, 4E3	220	64-22	LEVELING COURSE
	* BOND COAT	0.05-0.15GAL		

*FOR INFORMATION ONLY

PROPOSED TWO LANE SUPERELEVATED SECTION
OLD M-14 (ANN ARBOR ROAD)

TO APPLY: STA 1052+49.94 TO STA 1065+37.59 (E = 3.8% RT, Δ% = 0.39)
STA 1137+13.21 TO STA 1148+43.41 (E = 4.2% LT, Δ% = 0.40) 10

9

0 1 2 3 4 5 6

3 SCALE
(VERTICAL SCALE VARIES)

4-7

MDOT Michigan Department of Transportation

RURAL - SUPERELEVATED - HMA

DATE	CONT. SEC.	JOB NO.	DESIGN UNIT	SHEET NO. R.O.W	SHEET NO. CONST.
04/05/07			4		

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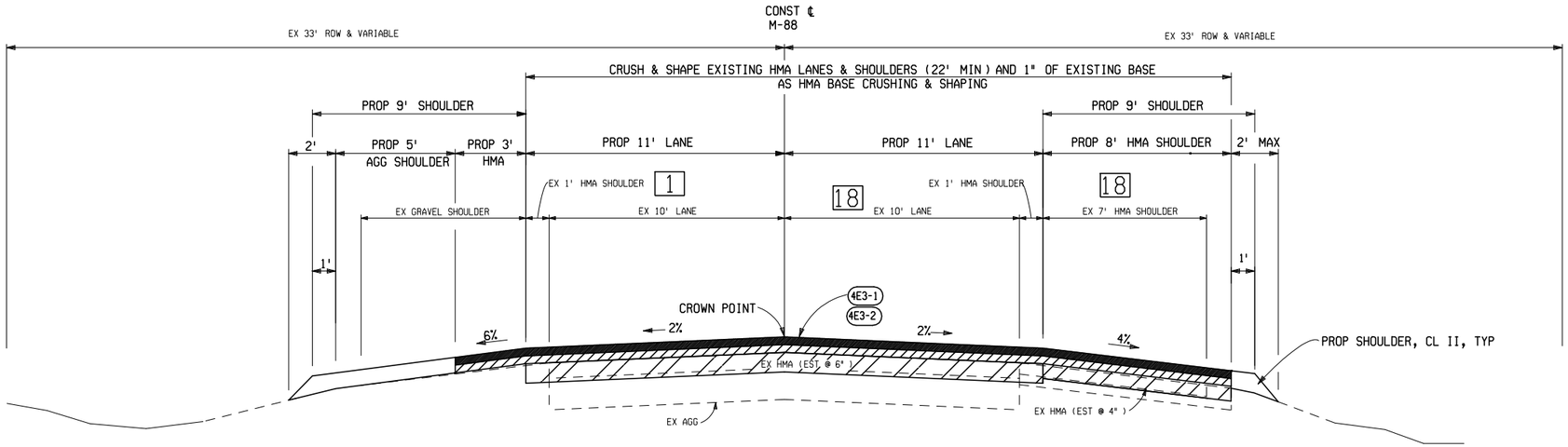
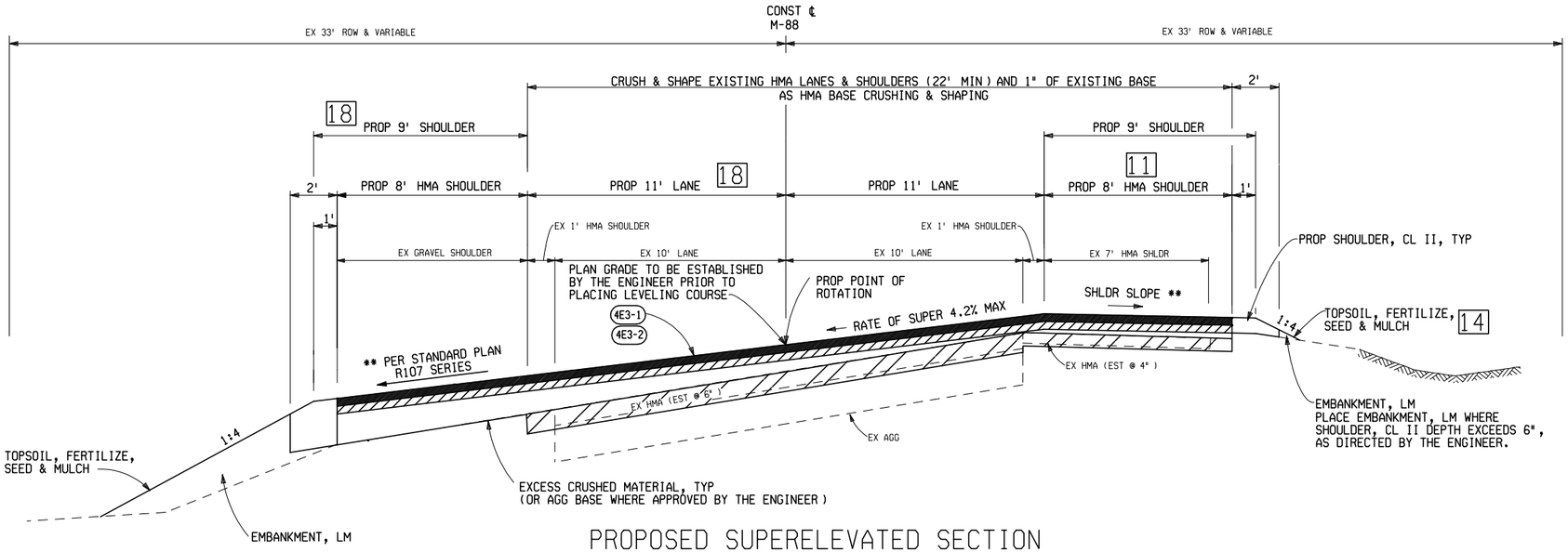
			FINAL R.O.W.
AUTH	DATE	NO.	REVISION



PROPOSED NORMAL SECTION

TO APPLY: STA 59+48.23 TO STA 187+75.21
STA 194+16.61 TO STA 300+03.00 (POE) 2



PROPOSED SUPERELEVATED SECTION

TO APPLY : STA 187+75.21 TO STA 194+16.61 2 10

** PROP SHOULDER SLOPES AS PER STANDARD PLAN
R107 SERIES OR AS SHOWN ON PLANS.

HMA APPLICATION ESTIMATE 16

IDENT NO.	ITEM	RATE LBS PER SYD	PERFORMANCE GRADE	REMARKS
4E3-1	HMA, 4E3	220	64-28	TOP COURSE AWI = 260
4E3-2	HMA, 4E3	220	64-28	LEVELING COURSE
3E3	HMA, 3E3	330	58-28	BASE COURSE
HMAA-1	HMA APPROACH	440	64-28	HMA 4E3, 2 COURSES
HMAA-2	HMA APPROACH	275	64-28	HMA 4E3
	* BOND COAT	0.05-0.15 GAL		

*FOR INFORMATION ONLY

9

0 1 2 3 4 5 6

3 SCALE
(VERTICAL SCALE VARIES)

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FILE NAME:

4-8

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TRUNKLINE RURAL - HMA CRUSH & SHAPE

DATE	CONT. SEC.	JOB NO.	DESIGN UNIT	SHEET NO. R.O.W	SHEET NO. CONST.
04/05/07			4		

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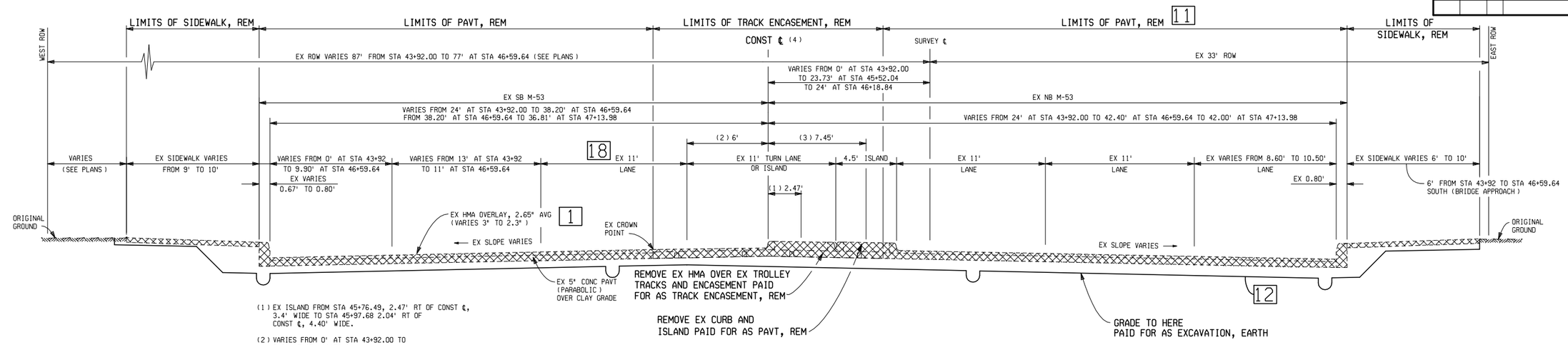
			FINAL R.O.W.



(1) EX ISLAND FROM STA 45+76.49, 2.47' RT OF CONST ℄, 3.4' WIDE TO STA 45+97.68 2.04' RT OF CONST ℄, 4.40' WIDE.

(2) VARIES FROM 0' AT STA 43+92.00 TO 5.0' AT STA 46+59.64

(3) EX ISLAND LOCATED 8.01' RT OF CONST ℄ AT STA 46+65.99 TO 7.45' RT OF CONST ℄ AT STA 47+13.98

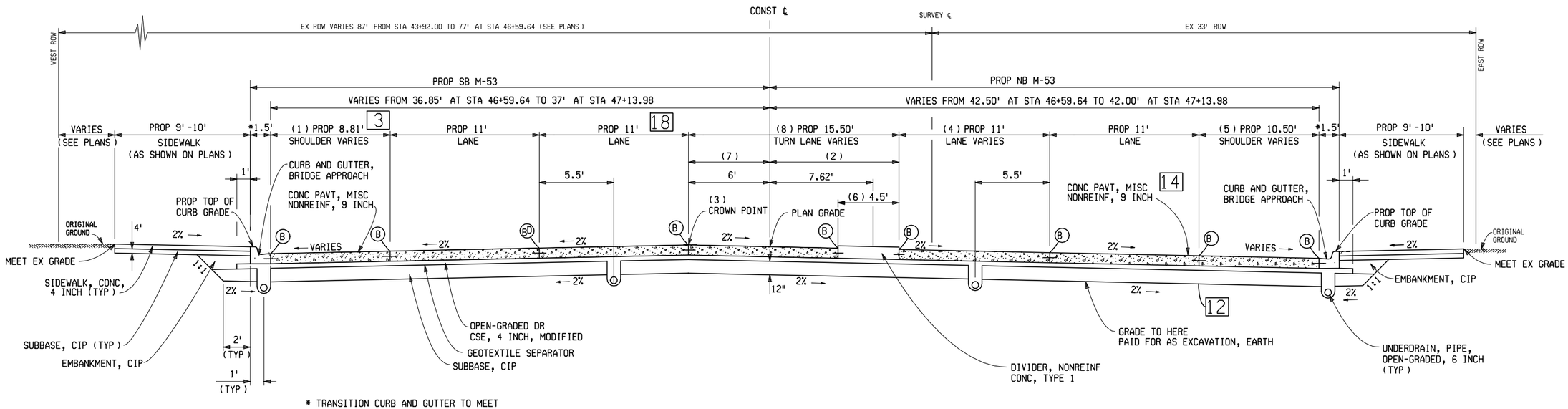
(4) CONTRACTOR TO FIELD VERIFY LOCATION OF TROLLEY TRACKS. LOCATIONS SHOWN ARE BASED ON OLD PLANS

M-53 EXISTING I-94 SOUTH BRIDGE APPROACH TYPICAL CROSS SECTION

TO APPLY:
STA 43+92.00 TO STA 47+13.98

2

SEE MISC DETAILS SHEET 18
FOR BRIDGE APPROACH.
SEE DETAIL GRADE SHEET 109
FOR PAVEMENT DETAILS FROM
STA 43+92 TO STA 46+59.64



* TRANSITION CURB AND GUTTER TO MEET BRIDGE APPROACH CURB AND GUTTER FROM 1.5' TO 0.8' (SEE MISC DETAILS)

M-53 PROPOSED I-94 SOUTH BRIDGE APPROACH TYPICAL CROSS SECTION

TO APPLY:

STA 43+92.00 TO STA 47+13.98

9

0 1 2 3 4 5 6
4 SCALE
(VERTICAL SCALE VARIES)

15

(1) TAPER FROM 0' AT STA 43+92.00 TO 3.23' AT STA 44+52 AND FROM 3.23' AT STA 44+52 TO 9.80' AT STA 46+35.95 TO STA 46+59.64. TAPER FROM 9.80' AT STA 46+59.64 TO 8.81' AT STA 47+13.98.

(2) VARIES FROM 0.00' AT STA 43+92 TO 2.00' AT STA 45+04.00 TO 11.20' AT STA 46+18.84 AND FROM 11.20' AT STA 46+18.84 TO 10.00' AT STA 46+59.64. VARIES FROM 10.00' AT STA 46+59.64 TO 9.50' AT STA 47+13.98

(3) TRANSITION CROWN POINT FROM CONST ℄ AT STA 45+73.43 TO 5.00' LEFT OF CONST ℄ AT STA 46+59.64. TRANSITION CROWN POINT FROM 5.00' LEFT OF CONST ℄ AT STA 46+59.64 TO 6.00' LEFT OF CONST ℄ AT STA 47+13.98.

(4) VARIES FROM 11.00' AT STA 44+52.00 TO 13.00' AT STA 45+04 13.00' AT STA 45+04.00 TO STA 46+59.64. VARIES FROM 13.00' AT STA 46+59.64 TO 11.00' AT STA 47+13.98.

(5) PROP 8.50' FROM STA 43+92.00 TO STA 46+59.64 VARIES FROM 8.50' AT STA 46+59.64 TO 10.50' AT STA 47+13.98.

(6) CONC DIVIDER 3' WIDE, 7.62' RT OF CONST ℄ AT STA 46+66.25 TO 4.50' WIDE 7.62' RT OF CONST ℄ AT STA 46+93.84 TO STA 47+13.98.

(7) VARIES FROM 0.00' AT STA 43+92 TO 2.00' AT STA 46+12.57 TO 2.72' AT PI STA 46+18.93 AND FROM 2.72' AT PI STA 46+18.93 TO 5.00' AT STA 46+59.64 FROM 5.00' AT STA 46+59.64 TO 6.00' AT STA 47+13.98.

(8) VARIES FROM 0' AT STA 43+92.00 TO 23.73' AT STA 45+52.04 TO 24' AT STA 46+18.84.

MDOT Michigan Department of Transportation

TRUNKLINE URBAN RECONSTRUCTION-NORMAL-CONCRETE

DATE	CONT. SEC.	JOB NO.	DESIGN UNIT	SHEET NO. R.O.W	SHEET NO. CONST.
04/05/07			4		

DATE:
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